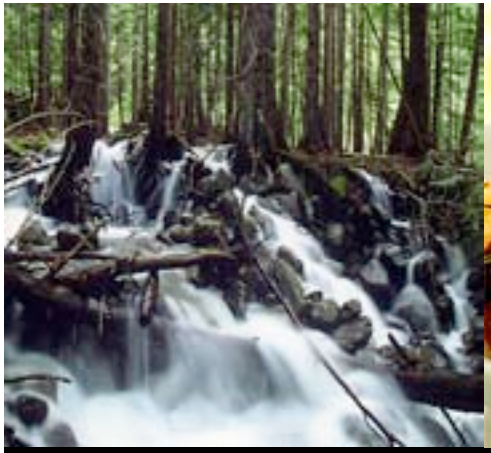


Identifying Important Ecosystem Services in Puget Sound

Meridian Institute
NOAA Fisheries
Puget Sound Partnership
World Resources Institute

World Resources Institute

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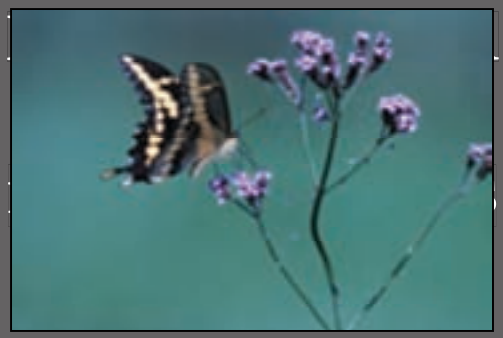
Interview results

Implications of interview results

3 categories of ecosystem services

Provisioning

Regulating



Cultural

Project goals

Identify “most important” ecosystem goods and services provided by Puget Sound in order to help Partnership:

1. Define what a “healthy Sound” is
2. Prioritize indicators for measuring and monitoring the status of the Sound
3. Communicate the goals of the Partnership
4. Prioritize strategies and actions

Interview process

—Mid-May to early July 2008

—45 interviewees identified by Partnership staff, some in conjunction with ECB representatives

—Interviewees represent major stakeholder groups ("sectors"):

- Agriculture
- Business
- Cities
- Counties
- Environmental Interests
- Fishing and aquaculture
- Forestry
- Homebuilding
- Ports and Shipping
- Recreation
- Tourism
- Tribal governments

—Some interviewees on ECB, some not

Interview process (continued)

Interviewees asked questions to identify:

—Which ecosystem goods and services (from list) most contribute to well-being / interests of sector?

—In what way do these services benefit sector?

—What major trade-offs exist between services?

Interviewee affiliations, by sector

Sakuma Brothers	agriculture
Western Washington Agricultural Assoc.	agriculture
Association of Washington Business	business
Building Industry Association of Washington	business
Microsoft	business
Seattle Chamber of Commerce	business
Starbucks	business
Association of Washington Cities	cities
City of Kent, Environmental Engineering	cities
City of Kent, Environmental Conservation	cities
Federal Way City Council	cities
Port Townsend	cities
City of Sultan	cities
Pierce County Council	counties
Pierce County Water Programs	counties
San Juan County Council	counties
People for Puget Sound	environmental interests
The Nature Conservancy	environmental interests
Northwest Indian Fisheries Commission	fishing and aquaculture
Sport Fishing Alliance	fishing and aquaculture
Taylor Shellfish	fishing and aquaculture
Family Forest Foundation	forestry
Port Blakely Tree Farms	forestry
Washington DNR	forestry
Washington Forest Protection Association	forestry
Built Green Washington	homebuilding
Master Builders Association	homebuilding
Quadrant Homes	homebuilding
Port Angeles	ports/shipping
Washington Ports Association	ports/shipping
American Whitewater	recreation
Marine Trades Association	recreation
Washington Recreation and Park Association	recreation
Washington Scuba Alliance	recreation
Washington Wildlife and Recreation Coalition	recreation
National Parks Service	tourism
Port of Seattle, Cruise Lines Div.	tourism
San Juan Safaris	tourism
Trade and Economic Development (CTED)	tourism
Washington State Convention and Trade Center	tourism
Washington State Parks	tourism
Nisqually Tribe	tribal governments

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Interview results

	SECTORS												
ECOSYSTEM SERVICES	Environmental interests	Tribal governments	Cities	Counties	Recreation	Agriculture	Forestry	Fishing & aquaculture	Tourism	Homebuilding	Business	Ports & shipping	Total sectors citing 'high importance' (n=12)
Crops													5
Livestock													1
Capture fisheries													9
Aquaculture													8
Wild foods													2
Timber and other wood fiber													6
Other fibers													0
Biomass fuel													0
Water													12
Genetic resources													3
Biochems, nat meds, pharmacls													1
Air quality regulation													3
Global climate regulation													1
Regional and local climate regulation													0
Water regulation													11
Erosion regulation													7
Water purification and waste treatment													9
Disease regulation													1
Pest regulation													0
Pollination													0
Natural hazard regulation													3
Recreation and ecotourism													11
Ethical and existence values													11

"Most important" ecosystem services across sectors

Tier I

Water
Water regulation
Recreation and ecotourism
Ethical and existence values

Tier II

Capture fisheries
Aquaculture
Water purification and waste treatment

Water (Tier I)

Definition

—Inland and marine bodies of water, groundwater, rainwater, and surface waters for household, industrial, and agricultural uses, as well as for water-borne navigation and commerce services

Types of benefits cited by interviewees

—Sufficient quantities of water for households, industry, in-stream flows
—Water for hydropower
—Marine navigation and commerce

Water (Tier I): Perspectives

Homebuilding sector

—Need sufficient water supplies where they are building to proceed with development

Cities sector

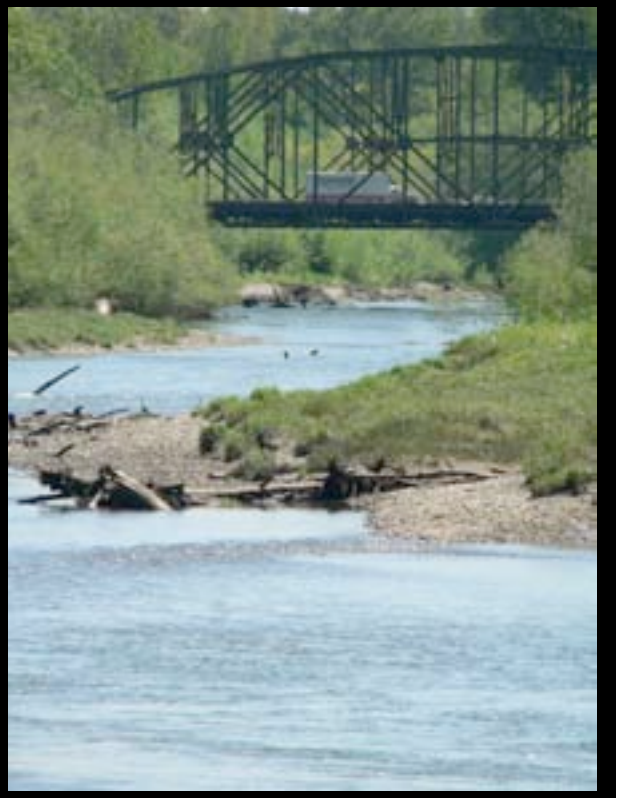
—Need to ensure development envisioned can take place, given available water resources and water rights

Business sector

—Low electricity rates provide competitive advantage (90% of power for Seattle and Tacoma from hydro)

Ports and shipping sector

—Sound provides variety of waterborne navigation and commerce services



Water regulation (Tier I)

Definition

—Influence ecosystems have on timing and magnitude of water runoff, flooding, and aquifer recharge, particularly in terms of water storage potential of ecosystem or landscape

Types of benefits cited by interviewees

—Storm water management
—Timing and availability of water supplies
—Flood and drought mitigation
—Natural storage as snowpack

Water regulation (Tier I): Perspectives

Counties sector

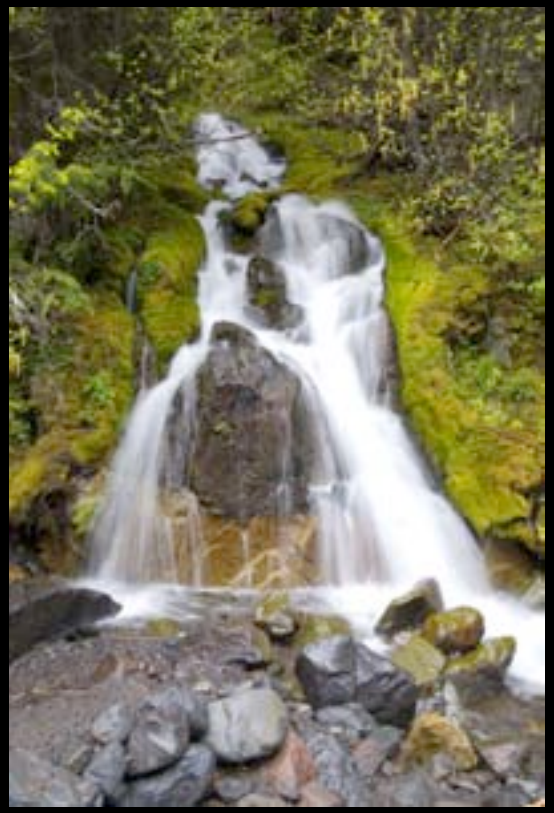
—Rely on natural landscapes to collect and filter storm water to ensure high quality supply of freshwater

—Rely on high functioning flood plains and wetlands, which can provide natural flood prevention

—Rely on natural storage function of snowpack, which sustains various users during summer months

Environmental sector

—Rely on adequate levels of ground water recharge to ensure sufficient stream flows to support freshwater habitats



Water purification & waste treatment (Tier II)

Definition

—Role ecosystems play in the filtration and decomposition of organic wastes and pollutants in water; assimilation and detoxification of compounds through soil and subsoil processes

Types of benefits cited by interviewees

—Natural filtration

—Capacity to assimilate pollution

Water purification & waste treatment (Tier II): Perspectives

Forestry sector

—Active forest management in watersheds helps provide good water quality to Seattle and Tacoma

Counties sector

—Ecosystems can assimilate, filter and decompose pollution (but they have a finite capacity to do so)

Recreation and ecotourism (Tier I)

Definition

—Recreational pleasure people derive from natural or cultivated ecosystems

Types of benefits cited by interviewees

—Numerous recreational opportunities for residents
—Premier destinations of uncommon quality
—Dynamic tourist destination with both urban *and* natural attractions
—Large source of revenue and jobs for local economy
—Recreational amenities which help recruit and retain employees

Recreation and ecotourism (Tier I): Perspectives

Cities sector

—Most residents recognize that tourism is a large component of the economy (a recent study notes that "visitor and recreation activity in Puget Sound generates $5.2 billion in revenue and 62,000 jobs…"[1])

Tourism sector

—Seattle area is a particularly dynamic tourist destination serving as a gateway to natural amenities

Business sector

—Recreational amenities provided by the Sound provide area residents with good quality of life and help local businesses recruit and retain employees

[1] http://www.pugetsoundnearshore.org/technical_papers/coastal_habitats.pdf

Ethical and existence values (Tier I)

Definitions

—Spiritual, religious, aesthetic, existence, or other values people attach to ecosystems, landscapes, or species

Types of benefits cited by interviewees

—Aesthetic value of area attracts “best and brightest” members of the labor force
—Aesthetic value of area provides residents with quality places to live
—Traditional Tribal ways of life
—A healthy, thriving waterfront
—Agricultural lifestyles

Ethical and existence values (Tier I): Perspectives

Forestry sector
—Attractiveness of area is what brings creative, innovate people

Homebuilding sector
—Ambiance and high quality of life is large part of what the area sells – what attracts people to want to live here

Tribal governments
—Locally grown food, gathering of wild foods, salmon, and shellfish—services that support Tribal cultures—are of utmost importance

Agricultural sector
—Rural lifestyles and open space are integral part of farming

Capture fisheries (Tier II)

Definitions

—Wild fish captured through trawling and other non-farming methods

Types of benefits cited by interviewees

—Sustainable livelihoods for Tribal nations

—Recreational value for boaters

Capture fisheries (Tier II): Perspectives

Fishing and aquaculture sector

—Tribal communities depend upon salmon harvest

Recreation sector

—Recreational fishing by boaters for various species

Aquaculture (Tier II)

Definitions

—Fish, shellfish, and/or plants that are bred and reared in ponds, enclosures, and other forms of freshwater or saltwater confinement for purposes of harvesting

Types of benefits cited by interviewees

—Shellfish cultivation and harvesting important segment of local economy

—Particularly important component of Tribal economies and livelihoods

Aquaculture (Tier II): Perspectives

Counties sector

— Shellfish industry is multi-million dollar industry ("Washington State [is] the second largest oyster-producing region in the country, now worth about $50 million per year…geoduck harvest has generated $60 million of public funds through auctions of harvest quotas…"[1])

Tribal governments

– Shellfish very important for providing for tribal communities and economies

[1] http://www.pugetsoundnearshore.org/technical_papers/coastal_habitats.pdf

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Identify “most important” ecosystem goods and services provided by Puget Sound in order to help Partnership:

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1. Define what a "healthy Sound" is

Tier I and II Services	Benefits
Water	•Water for homes, industry, agriculture •Water for ecological functions •Water for hydropower generation •Water-borne navigation and commerce
Water regulation	•Storm water management •Timing and availability of water supplies •Flood and drought mitigation •Natural storage (snowpack and glaciers)
Water purification and waste treatment	•Natural filtration •Capacity to assimilate pollution
Recreation and ecotourism	•Provide residents with numerous recreational opportunities •Premier destinations of uncommon quality •Dynamic destination that provides both urban *and* natural attractions •Large source of revenue and jobs for local economy •Recruit and retain employees
Ethical and existence values	•Attract creative and innovative people •Provide residents with quality places to live •Support traditional Tribal ways of life •Provide a healthy, thriving waterfront •Support agricultural lifestyles
Capture fisheries	•Sustainable livelihoods for Tribes •Large source of revenue and jobs for the local economy •Recreational value
Aquaculture	•Sustainable livelihoods for Tribes •Large source of revenue and jobs for the local economy

2. Prioritize indicators for measuring and monitoring status of Sound

Address Tier I and II services

- Water
- Water regulation
- Water purification & waste treatment
- Recreation and ecotourism
- Ethical and existence values
- Capture fisheries
- Aquaculture

2. Illustrative assessment of indicators under Partnership consideration

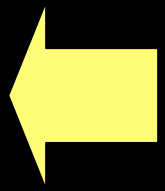
Gap
Possible gap
Adequate

Tier I and II Services	Benefits	Candidate indicators that address the service (examples)	Gaps in candidate indicator list
Water	• Water for homes, industry, agriculture	• Toxics in water • Annual stream flow stats • Toxics in biosolids from WWTPs • Snowpack measurements on April 1	• Additional and more robust water scarcity indicators may be needed (e.g. supply-demand imbalance in a watershed) • No apparent indicators for groundwater extraction and recharge
Water purification and waste treatment	• Natural filtration	• Terrestrial land cover status and trends (i.e., forest, agricultural, urban, impervious surface)	
Ethical and existence values	• Traditional Tribal ways of life	• Puget Sound fishing harvest – tribal (various species) • Salmon populations	• Need an indicator for non-fish wild foods (tribal uses)?

2. Prioritize indicators for measuring and monitoring status of Sound

Address Tier I and II services

- Water
- Water regulation
- Water purification & waste treatment
- Recreation and ecotourism
- Ethical and existence values
- Capture fisheries
- Aquaculture

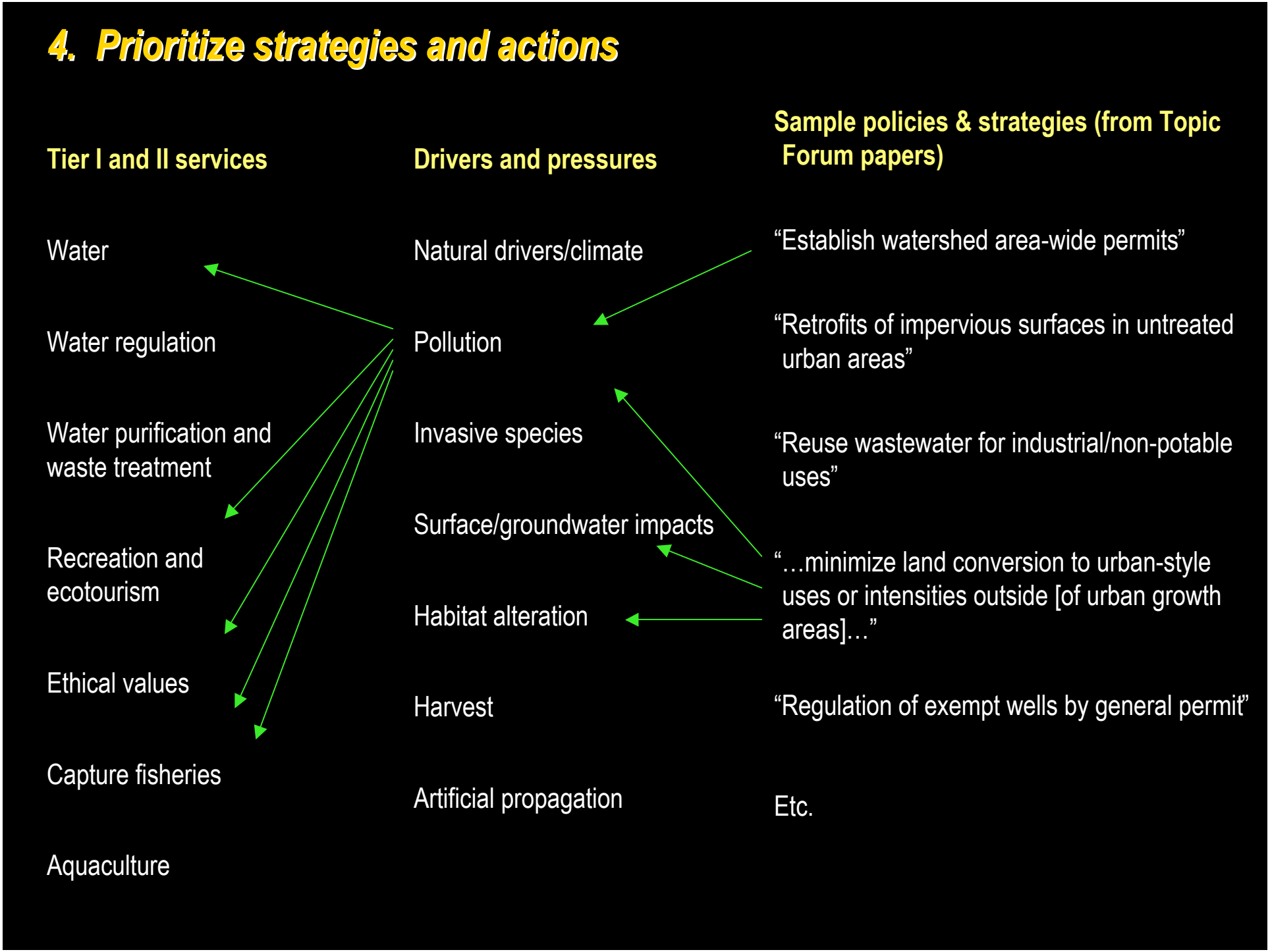


Include key types of indicators for each Tier I and II service

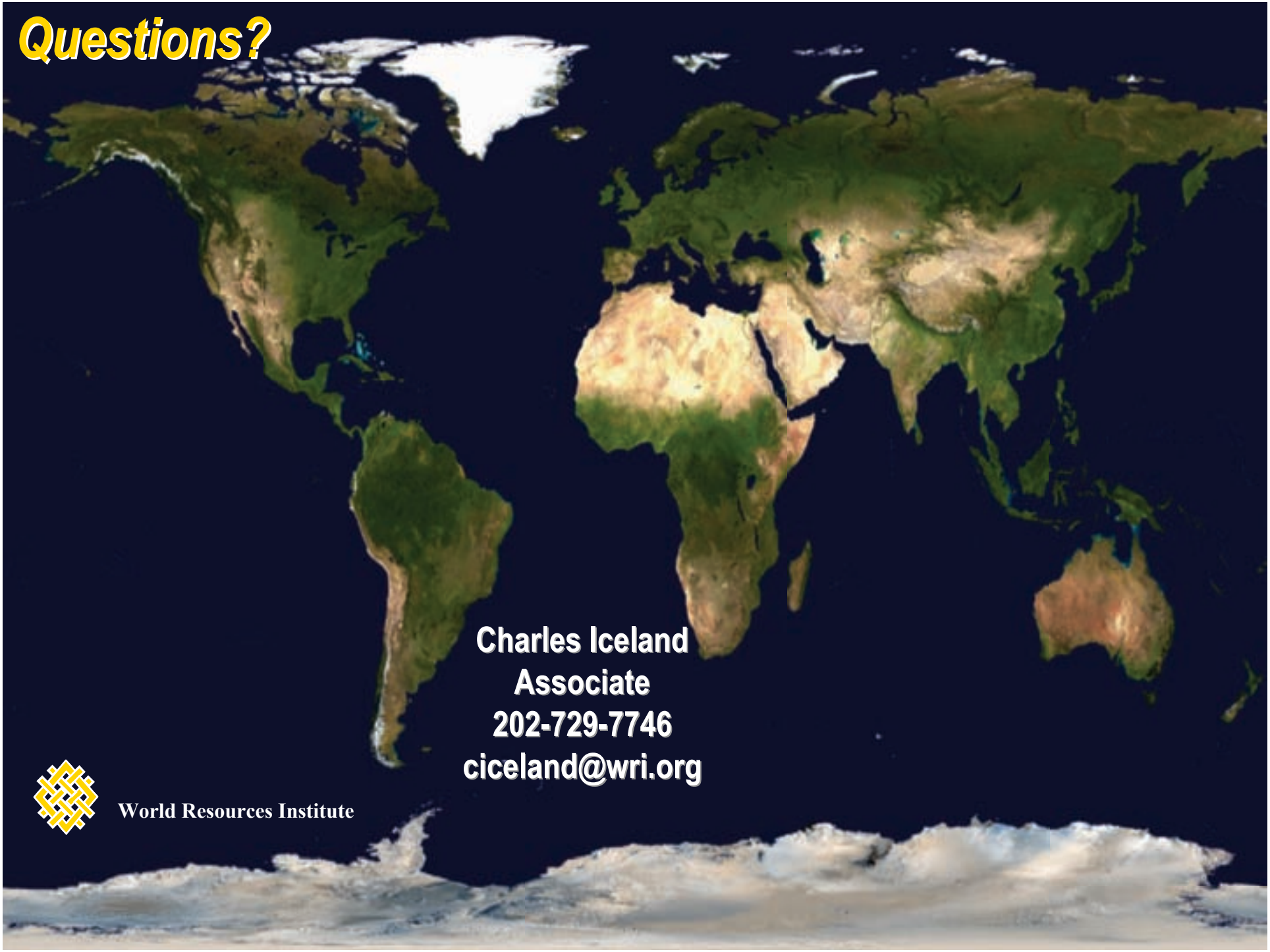
- Drivers and pressures
- State and impact
- Response

3. Communicate the goals of the partnership

4. Prioritize strategies and actions



Questions?



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Appendix

Key tradeoffs identified by interviewees

- —Competition for scarce land as regional population grows
- —Competition for water resources
- —Protecting the Sound while allowing continued use for marine navigation and commerce services
- —Public access to forests, shorelines, and marine environment

Competition for scarce land as regional population grows

—**Forests** provide multiple ecosystem services: timber, water regulation, water purification and waste treatment, carbon sequestration, biomass fuel, wild foods, genetic resources, erosion regulation, recreation, aesthetic values, etc.

—**Agricultural land** provides a number of ecosystem services: crops, livestock, water regulation, cultural values, etc.

—**Housing and commercial development** provides shelter and economic infrastructure, but impacts many ecosystem services.

Competition for water resources

—Almost every watershed in Puget Sound has local areas where freshwater supplies are not adequate to meet current human demands

— In most of the 12 watersheds in which the Department of Ecology has set in-stream flow rules, stream flows were met less than 50% of the time during low-flow periods, and in some watersheds, less than 80% of the time

—By 2075, models predict that the average discharge from the Sultan, Tolt, Cedar, Green, and White River basins will decrease by 27-42% during the summer and increase by 41-57% in the winter

Source: http://www.psp.wa.gov/downloads/AA2008/Revised%20Discussion%20Paper%20Water%20Quantity.pdf

Protecting the Sound while allowing its continued use for marine navigation and commerce services

Multiple marine navigation and commerce services:

1) deep water industrial terminals
2) barge terminals for short sea shipping or marine highways
3) recreational and commercial fishing
4) recreational boating
5) ferry and passenger services

Public access to forests, shorelines, and marine environment

Access to forest lands

—***Forestry sector perspective:*** General access can result in

- Meth labs
- Trespassers burning transformers to try to get copper out
- Junk (e.g., broken down cars, refrigerators, and couches)

Access to tidelands

—***Fishing and aquaculture sector perspective:*** Shellfish harvesters vs. shoreline homeowners as shorelines develop adjacent to tidelands

Access to rivers and to the Sound itself

—***Recreational sector perspective:*** Ten to twenty years ago there was a lot of private forest land through which one could access rivers. Now private communities block such access.

—***Recreational sector perspective:*** Scuba divers losing access to traditional diving sites (e.g., DNR removing creosote pilings)